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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/590,795	06/08/2000	Vishnu K. Agarwal	6047-53173	9849

7590 04/12/2002

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EXAMINER

VU, DAVID

ART UNIT	PAPER NUMBER
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2818

DATE MAILED: 04/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/590,795

Applicant(s)

AGARWAL ET AL.

Examiner

DAVID VU

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-71 is/are pending in the application.
- 4a) Of the above claim(s) 43-58, 64, 65 and 71 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-42, 59-63 and 66-70 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.

- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/ Restriction

1. Application's election without traverse of Species I (Claims 1-42, 59-63 and 66-70) in Paper No.6 is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 14, 30 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Fieberg et al.,(US 4,105,442).

Fieberg et al, in related text (Col. 4, Lines. 56-59) disclose a method of forming a ruthenium-containing enhanced-surface-area electrically conductive layer, the method comprising: depositing a layer consisting essentially of ruthenium oxide onto a supporting structure; and annealing the layer in reduced pressure environment in a non-oxidizing ambient so as to substantially convert the ruthenium oxide to ruthenium, leaving a roughened layer consisting essentially of ruthenium on the supporting structure.

3. Claims 15 and 20-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Fieberg et al.,(US 4,105,442).

Fieberg et al, in related text (Col. 4, Lines. 56-59) disclose a method of forming an enhanced-surface-area electrically conductive structure, the method comprising: providing a layer containing ruthenium oxide; and converting some ruthenium oxide in the layer to ruthenium by heating the layer in a reduced-pressure environment in a non-oxidizing ambient so as to produce a ruthenium-containing layer having a rough surface, and exposing the layer having a rough surface to a ambient suitable to decrease the tendency of the layer to react with surrounding material. (See Col. 9, Claims. 1 and 10)

4. Claims 59-63 are rejected under 35 U.S.C. 102(b) as being anticipated by Fieberg et al.,(US 4,105,442).

Fieberg et al, in related text (Col. 4, Lines. 56-59) disclose a method of forming a passivated layer of ruthenium or ruthenium oxide during fabrication of an electronic device, the method comprising: providing a layer of ruthenium or ruthenium oxide; and annealing the layer in a nitrogen-supplying or nitrogen-supplying and reducing ambient so as to passivate the layer.(See Col. 9, Claims. 1 and 10)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-13 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over TSURUMI KAZUNORI,(JP 57075653).

TSURUMI KAZUNORI, disclose all claimed subject matter, but fails to expressly disclose the grain size, pressure and temperature of the ruthenium-containing layer.

TSURUMI KAZUNORI, in related text, (Page. 3, Lines. 1-3 and Embodiment 1) disclose the method comprising: forming a layer of conducting material; forming a layer comprising ruthenium oxide on the layer of conducting; material; and Ru is formed by reducing the ruthenium oxide in a hydrogen atmosphere at 500C.

However, the specific grain size pressure and temperature of the ruthenium-containing layer does not provide any critical or unexpected results to the method of forming an enhanced-surface-area electrically conductive structure. Rather, it is merely an obvious design choice determinable by routine experimentation. In *Aller*, the court stated, "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456 105 USPQ 233,235 (CCPA 1995).

6. Claims 33, 34-40, 41-42 and 66-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zurcher et al. (US 6,344,413) in view of Fieberg et al.,(US 4,105,442).

Zurcher et al, disclose all claimed subject matter, but fails to expressly disclose the converting some ruthenium oxide in the layer to ruthenium by heating the layer in a reduced-pressure environment in a non-oxidizing ambient so as to produce a ruthenium-containing layer having a rough surface

Zurcher et al, in related text, (Col. 3, Line. 12-Col. 4, Line. 43) and figures (Fig. 5-7) disclose a method of forming a capacitor, the method comprising: providing a first layer of electrically conductive material 50; forming a layer RuO/Ru on the layer of electrically conductive material 50; forming a layer of dielectric material 75 over RuO/Ru layer 70; and forming a second layer of conductive material 80 over the layer of dielectric material 70. It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the roughened layer of RuO/Ru since it may be used as a capacitor electrode to provide an enhanced-surface area electrically conductive layer.

Zurcher et al, disclose all claimed subject matter, but fails to expressly disclose the grain size, pressure and temperature of the ruthenium-containing layer. However, the specific grain size pressure and temperature of the ruthenium-containing layer does not provide any critical or unexpected results to the method of forming an enhanced-surface-area electrically conductive structure. Rather, it is merely an obvious design choice determinable by routine experimentation. In *Aller*, the court stated, "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In *re Aller*, 220 F.2d 454, 456 105 USPQ 233,235 (CCPA 1995).

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Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (703) 305-0391. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms., can be reached on (703) 308-4910.

David Vu DV

Art Unit 2818

DNA
Hoa V. Ho
Primary Examiner
Art Unit 2818